

CLIMATOLOGICAL DATA FOR JANUARY, 1912.

DISTRICT No. 4, THE LAKE REGION.

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GENERAL SUMMARY.

In the Lake region the month was the coldest January of record, not only as regards the mean temperature, but also with respect to the length of the period of extremely severe weather, and the number of consecutive days on which zero temperatures occurred. Following an unusually mild December, the bitter cold of the first 16 days occasioned much suffering, especially in the cities, where unpreparedness was general in the tenement sections, and where the situation was accentuated by the forced cessation of many kinds of outdoor work that usually furnish thousands with employment. A number of deaths from exposure were reported, and accidents due to slippery streets and icy roads were of common occurrence. Fires were far more frequent than is usual, and the difficulties in subduing flames once started were much increased in many places by the freezing of hydrants.

Precipitation was generally deficient in amount and quite irregularly distributed. The snow covering in northern New York afforded a favorable opportunity for logging, and much timber was cut in that section; but the operation of lumbering in the Lake Superior region was hampered because of poor roadbeds, due to the extreme dryness and powdery condition of the snow. This dry condition also caused much drifting in localities where the falls were heaviest, resulting in delays and interruptions to communication by rail and road.

At a distance from the leeward shores of the lakes, clear weather was the rule, and the amount of sunshine was considerably greater than is usual for January, except over the peninsula of lower Michigan, where a deficiency occurred.

The following table summarizes the chief features of meteorological interest in the various portions of the district:

Portions of States lying within district No. 4.	Temperature.		Precipitation.			Mean snowfall (inches).	Number of days.			Prevailing wind direction.
	Mean.	Departure from normal.	Mean.	Departure from normal.	Greatest in 24 hours.		Precipitation.	Clear.	Partly cloudy.	
Minnesota.....	-7.3	-16.6	0.28	-0.59	0.20	3.3	3	19	7	5 w.
Wisconsin.....	-0.3	-17.5	0.69	-0.72	0.80	9.7	6	17	6	3 w.
Illinois.....	11.9	-11.9	0.84	-1.16	0.26	7.1	12	8	8	15 w.
Indiana.....	12.9	-13.0	1.19	-1.24	1.00	8.9	8	10	4	17 sw.
Upper Michigan.....	-1.1	-15.2	1.56	-0.23	1.13	18.3	11	12	6	13 w.
Lower Michigan.....	9.4	-12.8	1.58	-0.65	1.50	15.7	10	7	7	17 w.
Ohio.....	15.4	-11.1	2.26	-0.25	1.50	11.6	11	8	6	17 w.
Pennsylvania.....	16.4	-10.1	3.46	+0.43	0.71	23.5	26	1	6	24 w.
New York.....	11.6	-9.2	2.46	-0.36	1.25	22.3	14	8	9	14 w.
Vermont.....	8.0	-9.0	1.76	-0.71	0.61	21.2	12	10	7	14 n.

TEMPERATURE.

The mean temperatures were deficient by the largest amounts ever recorded for this district in January, the departures for the month ranging from an average of -9° over the Lake Champlain watershed to almost -18° in the region of western Lake Superior. At no station was the deficiency less than 6.7° , while at Sturgeon Bay, Wis., the mean temperature was 20.7° below the normal. The lowest temperatures occurred generally on the 6th or 7th over northern Indiana and to the westward and northward of Lake Michigan; on the 13th over lower Michigan, northern Ohio, and portions of New York State; and on the 26th in the extreme east. The highest readings were noted on the 18th and 19th in the sections east of Lake Michigan, and on the last four days of the month throughout the remainder of the district. The absolute range was 98° , from -50° , at Stephens Mine, Minn., on the 7th, to 48° , at Syracuse, N. Y., on the 18th.

As stated in the preceding report, December closed with temperatures rapidly falling over the western portions of the district, due to the passage eastward of a storm center along the northern boundaries, and to the closely following field of high barometric pressure. The cold ushered in by this movement was intense, and, under the influence of persistent anticyclonic areas, was continuous throughout the entire Lake region until the 16th of January. The several atmospheric depressions that crossed the district during this period moved with such rapidity and direction as to exhibit no moderating effect upon the prevailing low temperatures, except in a few instances near the eastern confines. Practically all were, indeed, of the class sometimes designated "cold lows." The remainder of the month was not so cold, yet west of the eighty-fifth meridian the temperature remained almost constantly below normal, and to the eastward was above the average during but three intervals of only a day or two each.

No station west of Pennsylvania experienced more than 4 days on which the daily mean temperature was above the normal, nor did the excess in any instance reach 10° . Over the New York and Vermont sections of the district the daily mean temperature was above normal on from 5 to 9 days, and the greatest excess for any one day was 17° .

PRECIPITATION.

Precipitation was less than the average over practically the entire district, but with the exception of the southwestern portions the departures were generally less than 1 inch. There were, however, small areas on the southeastern shore of Lake Superior, the northeastern shore of Lake Michigan, the southern shore of Lake Erie, and the

eastern shore of Lake Ontario, where the monthly amounts were considerably greater than the average. Over these sections and throughout the entire region east of central Ohio precipitation occurred frequently, there being, as a rule, more than 20 days on which measurable amounts fell, and at a few stations there was rain or snow in some quantity on every day of the month. On the other hand, precipitation was comparatively infrequent over the central, southern, and eastern portions of lower Michigan, northwestern Ohio, northern Indiana, eastern Wisconsin, and northeastern Minnesota.

Snow.—Practically all of the precipitation occurred as snow, with the exception of that in northeastern Indiana and northern Ohio, where rains on the 18th, 28th, and 29th amounted to about one-half of the total fall of the month. The depth of snowfall ranged from about 3 inches near the western end of Lake Superior to more than 20 inches over the eastern sections of the district. At the beginning of January snow covered the Lake region with the exception of the area south of Lake Erie, and after the first few days the covering was continuous. Although the depths varied somewhat from time to time, at the close of the month there was a blanket of about 3 inches in depth along the southwestern borders, increasing thence to between 30 and 35 inches on the Superior shore and to about 20 inches in northern New York.

ICE.

At the opening of the month the ice was confined practically to the western end of Lake Superior, and to floating and shore ice in the northern portions of Lakes Huron and Michigan. The continuous cold, however, caused rapid formation of ice in all lakes, and measurements at the various stations indicated in general a steady increase throughout the period. The last reports showed on the 29th from 12 to 29 inches in Superior, about 23 inches in northern Michigan, from 16 to 23 inches in Huron, from 14 to 18 inches in Erie, and from 12 to 14 inches in Ontario. Lake Champlain closed over on the 26th, about one week earlier than is usual.

The smaller lakes and streams not kept open were frozen over early in the month and afforded opportunity for an abundant harvest of ice of exceptional quality and thickness.

MISCELLANEOUS.

Auroras were observed at a number of stations during the month.

A *thunderstorm*, accompanied by rain changing to sleet, occurred in Allen and Hancock Counties, Ohio, on the 28th, and sleet fell along the southern shore of Lake Erie on the 29th.

JANUARY, 1912, LAKE LEVELS.

The following data are from the report of the United States lake survey office:

Lakes.	Above tidewater, New York.
	Feet.
Superior.....	601.75
Michigan-Huron.....	579.32
Erie.....	571.30
Ontario.....	244.76

Lake Superior is 0.13 foot lower than last month, 0.68 foot higher than a year ago, 0.38 foot below the average stage for January of the last 10 years, 1.03 feet below the high stage of January, 1901, and 0.87 foot above the low stage of January, 1880. It will probably fall 0.2 foot during February.

Lakes Michigan-Huron are 0.10 foot lower than last month, 0.03 foot higher than a year ago, 0.76 foot below the average stage for January of the last 10 years, 3.35 feet below the high stage of January, 1886, and 0.24 foot above the low stage of January, 1896. They will probably remain about stationary during February.

Lake Erie is 0.16 foot lower than last month, 0.26 foot higher than a year ago, 0.37 foot lower than the average stage of January for the last 10 years, 2.25 feet below the high stage of January, 1886, and 0.34 foot above the low stage of January, 1896. It will probably fall 0.1 foot during February.

Lake Ontario is 0.13 foot higher than last month, 0.01 foot lower than a year ago, 0.63 foot lower than the average stage for January of the last 10 years, 2.84 feet below the high stage of January, 1886, and 0.96 foot above the low stage of January, 1896. It will probably rise 0.1 foot during February.

TABLE 1.—Climatological data for January, 1912. District No. 4, Lake Region.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.								Precipitation, in inches.								Sky.	Prevailing wind direction.	Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeasured.	Number of rainy days.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.				
Minnesota.																						
Cloquet.....	Carlton.....	800	1	-8.7	-17.6	32	30	-45	7	39	0.30	-0.51	0.20	3.0	2	17	8	6	w.	w.	Walter McDonald.	
Duluth.....	St. Louis.....	1,133	41	-7.2	-17.6	21	29	-36	7	22	0.47	-0.51	0.18	5.6	8	17	8	6	w.	w.	U. S. Weather Bureau.	
Floodwood.....	do.....	1,257	6																			M. H. Schussler.
Stephens Mine.....	do.....	1,500	5																			Oliver Iron Mining Co.
Two Harbors.....	Lake.....	614	18	-3.1	-16.0	30	29	-35	7	33	0.19	-0.51	0.07	3.0	3	20	7	4	nw.	w.	G. W. Watts.	
Virginia.....	St. Louis.....	1,434	18	-10.2	-16.3	28	30	-45	7	40	0.23	-0.74	0.12	2.5	2	18	7	6	nw.	w.	Oliver Iron Mtning Co.	
Wisconsin.																						
Appleton.....	Outagamie.....	795	11	0.0	-16.0	27	30	-27	7	28	0.73	-1.19	0.22	10.8	9	18	8	5	w.	w.	Wm. O. Thiede.	
Ashland.....	Ashland.....	647	21	-3.8	-18.6	24	30	-33	6	33	0.38	-0.78	0.21	3.5	3	23	8	8	sw.	sw.	Sam Wheeler.	
Bayfield.....	Bayfield.....	635	3	-1.0	-19.3	23	30	-30	7	26	0.75	-0.78	0.25	9.0	5	20	8	3	w.	w.	John P. Kiel.	
Cecil.....	Shawano.....	804	14	-2.0	-19.3	28	30	-33	11	39	0.54	-0.78	0.18	7.0	6	20	5	6	sw.	sw.	Louis W. Schmidt.	
Crandon.....	Forest.....	1,060	17	-5.7	-17.3	29	31	-36	6	45	0.60	-0.78	0.0	6.0	6	17	8	nw.	nw.	Frank Shoemaker.		
Florence.....	Fond du Lac.....	1,293	21	-4.5	-17.9	24*	31	-33	6	36*	1.45	+0.37	0.80	24.2	6	24	0	7	nw.	nw.	Fred S. Evans.	
Fond du Lac.....	Fond du Lac.....	800	26	-0.4	-17.4	26	30	-26	7	36	1.06	-0.24	0.45	15.0	6	20	2	9	nw.	nw.	Geo. W. Marshall.	
Grand River Locks.....	Marquette.....	770	16	-1.8	-15.7	28	31	-33	12	41	0.44	-0.66	0.16	13.5	7	21	2	8	sw.	sw.	Jerry Parkinson.	
Green Bay.....	Brown.....	617	26	-1.1	-15.7	24	30	-27	7	29	0.59	-1.10	0.22	6.2	9	13	6	12	sw.	sw.	U. S. Weather Bureau.	
High Falls.....	Marinette.....	810	0	-2.6	-17.1	27	31	-37	13	43	0.10	-0.60	0.10	1.0	1	21	6	4	w.	w.	No. Hydro-Elec. Power Co.	
Iron River.....	Bayfield.....	1,096	3	-7.1	-17.1	26	31	-42	12	35	0.60	-0.20	0.20	6.0	5	24	1	6	w.	w.	Winfield E. Tripp.	
Kewaunee.....	Kewaunee.....	590	3	1.7	-18.3	29	31	-25	7	27	1.11	-0.30	0.30	11.1	6	9	2	10	w.	w.	Eugene V. Kimball.	
Manitowoc.....	Manitowoc.....	616	61	2.6	-16.5	28	23	-22	6	32	0.89	-0.81	0.36	11.0	5	11	9	11	w.	w.	Johanna Lups.	
Menasha.....	Winnebago.....	764	15								0.65	-0.24	0.18	9.0	6	21	2	8	sw.	sw.	Geo. T. Allanson.	
Menomonee Falls.....	Waushara.....	842	3	3.8	-17.9	32	26	-23	12	31	0.59	-0.45	0.22	6.6	8	17	8	6	nw.	nw.	Arthur H. Christman.	
Milwaukee.....	Milwaukee.....	681	41	5.6	-14.2	28	23	-18	6	22	0.78	-1.23	0.35	11.1	11	14	8	9	w.	w.	U. S. Weather Bureau.	
New London.....	Outagamie.....	762	16	-1.4	-18.0	28	30	-31	7	33	0.59	-0.57	0.20	10.0	4	13	8	10	nw.	nw.	August H. Pape.	
Oconto.....	Oconto.....	590	21	-0.5	-18.2	25	1	-30	6	33	0.90	-0.74	0.20	9.0	7	17	8	6	w.	w.	Wm. K. Smith.	
Oshkosh.....	Winnebago.....	744	23	-0.5	-18.3	29	30	-30	7	35	0.70	-0.71	0.20	7.0	4	23	4	4	w.	w.	Evan Vincent.	
Pine River.....	Waushara.....	900	17	-1.2	-17.9	32	30	-30	7	33	0.55	-0.45	0.18	8.4	8	14	9	8	w.	w.	Geo. H. Carpenter.	
Plum Island.....	Door.....	588	4	4.4	-17.9	27	1	-19	7	25	0.25	-0.72	0.15	16.5	7	16	10	5	w.	w.	Geo. C. Robinson.	
Plymouth §.....	Sheboygan.....	843	2	1.4	-16.1	28	22	-23	6	31	0.68	-0.30	0.30	11.6	9	17	4	10	nw.	nw.	Paul O. Feldrappe.	
Port Washington.....	Ozaukee.....	713	19	4.1	-16.1	26	21	-21	7	26	1.00	-0.92	0.40	10.0	5	17	4	10	nw.	nw.	Richard C. Kann.	
Racine.....	Racine.....	633	15	6.8	-16.9	31	23	-19	7	27	0.25	-1.51	0.12	5.0	4	18	1	12	nw.	nw.	Daniel Davis.	
Ripon.....	Fond du Lac.....	935	2	0.0	-17.9	26	31	-20	6	37	0.93	-0.32	0.32	11.0	5	17b	2	10b	w.	w.	Ripon College.	
Sheboygan.....	Sheboygan.....	831	13	4.4	-16.9	27	22	-22	6	31	0.95	-1.00	0.52	11.5	6	19	3	9	nw.	nw.	Louis C. Meyer.	
Sturgeon Bay.....	Door.....	600	13	0.0	-20.7	27	31	-28	7	36	0.80	-0.29	0.20	14.0	5	10	15	6	w.	w.	Adam N. Dier.	
Superior.....	Douglas.....	671	3	-6.0	-23	31	-35	12	36	0.14	-0.11	0.11	1.4	3	18	7	6	sw.	sw.	Edward B. Banks.		
Waupaca.....	Waupaca.....	857	17	-3.2	-19.4	30	30	-35	12	41	0.59	-0.42	0.18	15.5	6	19	5	7	w.	w.	James H. Flagg.	
Illinois.																						
Chicago.....	Cook.....	824	42	11.9	-11.9	38	23	-16	7	29	0.84	-1.16	0.26	7.1	12	8	8	15	w.	w.	U. S. Weather Bureau.	
Evanston.....	do.....	601	...	17.4	...	34	29	-17	7	38	0.47	...	0.16	6.8	7	...						City of Evanston.
Indiana.																						
Auburn.....	Dekalb.....	874	16	11.8	-13.5	39	17*	-22	13	36	0.76	-1.52	0.32	...	7	5	0	26	sw.	sw.	Mrs. Josie B. Kuhlman.	
Berne.....	Adams.....	849	3	15.0	-17.9	41	18	-20	13	30	1.71	-0.90	0.91	...	11	12	6	13	sw.	sw.	Henry M. Reusser.	
Ekhart.....	Ekhart.....	801	10	14.6*	-17.9	40	18	-14	7	26	1.27	-0.52	0.57	7.6	8	10b	1b	sw.	nw.	Dr. Miles Medical Co.		
Fort Wayne.....	Allen.....	856	16	14.2	-12.7	42	18	-14	7	26	1.39	-0.98	1.00	6.8	11	6	6	19	sw.	sw.	U. S. Weather Bureau.	
Hammond.....	Lake.....	598	21	11.7	-12.0	37	30	-30	18	7	43	1.11	-1.13	0.40	10.5	7	15	3	10	nw.	nw.	Carson W. Whitney.
Howe.....	Lagrange.....	886	7	12.9	-14.0	40	17	-12	7	36	1.03	-0.43	0.43	6.0	4	15	1	12	nw.	nw.	James E. Zook.	
South Bend.....	St. Joseph.....	726	19	11.2	-14.0	38	31	-16	7	39	1.39	-1.34	0.50	14.0	11	4	5	22	sw.	sw.	Henry H. Swaim.	
Whiting.....	Lake.....	606	3	11.6	-12.9	35	23	-17	7	32	0.85	-0.40	0.40	8.5	8	10	8	13	sw.	sw.	D. H. Boyd.	
Michigan, Upper Peninsula.																						
Baraga.....	Baraga.....	623	10	-10.4	-15.0	30	31	-45	6	58	1.40	-0.07	0.40	14.0	7	13	0	18	w.	w.	Duluth, S. S. & Atl. Ry.	
Bergland.....	Ontonagon.....	1,300	2	-10.4	-15.0	31	31	-45	6	58	1.40	-0.07	0.40	14.0	7	13	5	13	w.	w.	Frank McMonigal.	
Blanet.....	Schoolcraft.....		4																			
Calumet.....	Houghton.....	1,246	24	-1.2	-14.2	23	31	-19	8	25	3.20	-0.59	0.36	40.0	20	8	5	18	w.	w.	E. S. Grierson.	
Chatham.....	Alger.....	875	11	-2.0	-17.9	32	31	-34	13	41	1.73	-0.57	0.31	17.3	15	11	7	13	nw.	nw.	U. P. Experiment Station.	
Deer Park.....	Luce.....	610	11																			
Detour.....	Chippewa.....	585	11	3.2*	-12.4	23	30	-22a	12	36*	2.20	-0.32	1.00	22.0	8	11a	8a	11a	nw.	nw.	Linton Melvin.	
Eagle Harbor.....	Keweenaw.....	622	13	3.9	-16.0	23	31	-17	26	23	1.71	-0.22	0.26	17.1	18	4	7	20	nw.	nw.	John Nolen.	
Escanaba.....	Delta.....	612	19	0.0	-14.5	23	30	-22	7	32	0.73	-0.82	0.28	8.1	12	17	3	11	nw.	nw.	U. S. Weather Bureau.	
Ewen.....	Ontonagon.....	1,147	11	-6.4	-19.4	30	31	-31	6	55	1.37	+0.27	0.50	13.5	7	16	3	12	w.	w.	W. B. Hatfield.	
Grand Marais.....	Alger.....	610	11	5.2	-12.9	28	31	-12	6	64	2.24	+0.27	0.80	70.0	18	3	25	25	nw.	nw.	Mrs. Lena Truedell.	
Green.....	Ontonagon.....	622	1	0.0*	-17.9	23	31	-28	7	20	1.78	-0.26	0.29	26.4	18							

TABLE 1.—Climatological data for January, 1912. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeasured.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.		
<i>Lower Peninsula—Con.</i>																				
Alpena.	Alpena.	600	39	7.5	-11.2	26	1	-13	12	26	0.68	-1.52	0.24	19.8	12	6	15	w.	U. S. Weather Bureau.	
Ann Arbor.	Washtenaw.	930	32	11.4	-11.1	38	18	-12	13	21	1.69	-0.24	0.75	9.9	9	5	11	sw.	University of Michigan.	
Arbela.	Tuscola.	728	16	7.6	-15.4	35	18	-20	13	31	1.00	-1.29	0.27	7.5	7	3	7	nw.	Wm. Atkin.	
Battle Creek.	Calhoun.	822	28	11.4	-12.1	36	18	-15	13	25	0.81	-1.34	0.37	8.5	4	5	21	nw.	Elmer E. Sager.	
Bay City.	Bay.	593	16	8.4	-14.2	39	1	-13	13	27	1.30	-0.74	0.50	13.0	7	25	2	nw.	Pere Marquette R. R.	
Benzonia.	Benzie.	832	15	6.6	-14.9	27	1	-8	13	23	6.21	+ 2.93	1.50	70.9	24	1	12	18	Wallace Nutting.	
Berlin.	St. Clair.	23	9.4	-12.9	36	18	-15	13	25	0.79	-1.31	0.31	8.1	13	3	15	13	R. O. Gould.		
Big Rapids.	Mecosta.	906	16	8.4	-11.0	29	31	-24	13	33	1.72	-1.13	0.50	9.3	3	14	14	sw.	Supt. Water Works.	
Bloomingdale.	Van Buren.	8	12.8	—	38	19	-16	12	35	2.35	—	0.40	23.5	17	2	22	sw.	John M. Haven.		
Cadillac.	Wexford.	1,293	3	5.2	—	22	18	-24	12	28	0.69	—	1.8	12.2	9	10	4	17	Cadillac Water & Light Co.	
Cassopolis.	Cass.	903	11	15.6	-8.5	32	25	-2	14	25	0.95	-2.92	0.30	9.5	4	18	0	13	Michigan Central R. R.	
Charlevoix.	Charlevoix.	610	34	9.6	-11.1	30	1	-16	13	24	3.60	+ 1.07	0.80	36.0	12	6	4	21	Pere Marquette R. R.	
Charlotte.	Eaton.	8	9.9	—	37	18	-21	13	35	1.00	—	0.40	10.0	5	5	5	17	City of Charlotte.		
Cheboygan.	Cheboygan.	611	22	5.1	-13.5	24	1	-20	61	30	1.70	+ 0.05	0.55	14.5	6	9	19	nw.	E. A. Bouchard.	
Clinton.	Lenawee.	830	22	13.4	-10.3	38	18	-18	13	28	1.34	-0.55	0.36	10.3	7	9	11	nw.	David Woodward.	
Coldwater.	Branch.	984	15	12.4	-12.8	36	22	-14	13	30	0.46	1.40	0.40	5.5	5	7	6	sw.	Lake Shore & Mich. So. R.R.	
Concord.	Jackson.	7	11.0	—	38	18	-17	13	28	0.50	—	0.15	5.0	5	15	14	2	sw.	W. N. Armstrong.	
Croton.	Newaygo.	685	4	10.0	—	30	31	-22	12	36	1.50	—	0.40	15.0	9	4	15	12	Gr. R. & Musk. Power Co.	
Detroit.	Wayne.	730	41	13.0	-11.3	39	18	-4	5	23	1.99	+ 0.01	0.69	15.1	14	6	8	17	U. S. Weather Bureau.	
Durand.	Shiawassee.	799	4	10.5	—	40	18	-14	28	29	—	—	—	—	1	11	19	w.	H. J. Tobin.	
East Tawas.	Iosco.	590	15	8.4	-13.0	34	29	-15	28	33	—	—	—	—	18	12	1	w.	Detroit & Mackinaw Ry.	
Eloise.	Wayne.	640	15	12.8	-11.8	39	18	-15	13	27	1.34	-0.75	0.44	12.1	13	6	12	13	John Gilmore.	
Flint.	Genesee.	730	23	10.2	-11.7	37	18	-16	13	30	0.46	-1.30	0.25	5.0	5	9	5	17	William L. Fisher.	
Frankfort.	Benzie.	589	8	8.0	—	22	18	-13	28	27	5.20	—	0.80	52.0	20	0	0	31	Geo. Morency.	
Ganges.	Allegan.	665	3	13.4	—	30	22	-12	12	20	2.10	—	0.66	14.6	8	1	2	28	H. H. Hutchins.	
Gaylord.	Otsego.	1,367	12	2.8	-14.3	24	1	-39	6	42	1.39	-0.52	0.22	—	15	8	2	21	Michigan Central R. R.	
Gladwin.	Gladwin.	794	6	6.1	-14.1	29	31	-28	13	33	0.55	-0.70	0.30	6.0	3	22	3	6	Geo. R. Smith.	
Grand Haven.	Ottawa.	628	31	12.0	-12.5	28	17	-14	12	22	2.08	-0.72	0.39	31.3	22	3	4	24	U. S. Weather Bureau.	
Grand Rapids.	Kent.	707	23	11.8	-12.0	29	18	-9	12	18	1.49	-1.29	0.41	14.7	20	4	3	24	Do.	
Grape.	Monroe.	625	22	12.6	-12.9	38	18	-17	13	26	1.16	-0.48	0.60	8.0	9	6	8	17	Joseph W. Morris.	
Grass Lake.	Jackson.	989	6	9.2	—	29	1	-15	13	31	0.56	—	0.26	5.0	3	15	1	15	Menzo Conkin.	
Grayling.	Crawford.	1,147	22	5.0	-12.3	25	31	-34	12	41	0.95	-1.30	0.24	4.0	9	8	7	16	S. N. Insley.	
Harbor Beach.	Huron.	635	24	8.0	-14.5	35	18	-18	13	30	4.00	+ 2.12	0.80	40.0	8	0	7	24	Pere Marquette R. R.	
Harrison.	Clare.	1,159	19	—	—	28	29	-15	12	28	0.50	-1.23	0.30	5.0	2	9	5	17	Do.	
Harrisville.	Alcona.	616	28	7.1	-12.6	28	29	-15	6	34	2.20	-0.62	0.40	22.0	11	10	6	15	D. W. Mitchell.	
Hart.	Oceana.	698	20	9.0	-13.3	33	17	-26	12	33	5.30	+ 2.48	1.40	53.0	19	0	2	29	Pere Marquette R. R.	
Hayes.	Huron.	620	22	7.6	-14.5	30	18	-18	28	36	0.50	-1.52	0.40	5.0	3	12	3	16	C. F. Leipprandt.	
Highland.	Hillsdale.	830	20	—	—	—	—	—	—	—	1.00	-1.18	0.30	10.0	8	—	—	—	A. D. De Garmo.	
Holland.	Ottawa.	1,150	15	11.2	-12.9	37	18	-15	13	26	1.03	-1.03	0.35	9.2	9	12	7	6	nw.	
Howell.	Livingston.	610	6	11.0	—	31	30	-15	12	31	2.99	—	0.81	30.0	19	1	5	25	C. L. Herron.	
Ivan.	Kalkaska.	924	20	8.4	-13.7	29	23	-18	13	27	0.33	-1.44	0.10	3.3	9	6	10	15	City of Holland.	
Jackson.	Jackson.	927	16	11.7	-12.7	38	18	-17	13	28	0.60	-1.48	0.20	6.0	8	14	9	w.	Frank Sharp.	
Jeddo.	St. Clair.	667	23	8.4	-13.7	35	18	-18	13	26	1.12	-0.75	0.40	11.2	10	8	9	14	O. L. Giddings.	
Kalamazoo.	Kalamazoo.	955	36	12.0	-11.6	32	18	-11	13	27	0.80	-1.29	0.31	10.1	13	4	8	19	City of Jackson.	
Lansing (Agr. Col.).	Ingham.	820	48	9.2	-13.5	35	18	-17	13	31	0.80	-1.29	0.31	9.2	14	6	2	23	William Bice.	
Lansing (Capitol).	... do.	881	25	9.4	-13.4	35	17	-12	27	0.73	-1.47	0.18	—	—	—	—	—	Kalamazoo Asylum.		
Lapeer.	Lapeer.	827	13	9.3	-13.4	38	18	-14	13	32	—	—	—	—	—	—	—	U. S. Weather Bureau.		
Ludington.	Mason.	586	14	—	—	—	—	—	12	26	—	2.60	+ 0.33	0.50	26.0	14	1	5	25	State Board of Health.
Luther.	Lake.	1,028	2	6.1	—	27	31	-31	12	38	0.76	-0.23	0.23	14.2	14	4	5	20	Michigan Home.	
Mackinaw.	Cheboygan.	592	21	4.2	-13.2	35	21	-20	12	28	2.00	-0.19	0.50	20.0	7	13	14	4	Pere Marquette R. R.	
Mancelona.	Antrim.	1,121	16	5.2	-13.8	22	1	-28	12	34	2.00	-0.58	0.40	20.0	14	7	6	18	Do.	
Manistee.	Manistee.	600	15	9.6	-14.1	28	30	-16	12	33	2.00	-0.61	0.60	20.0	9	0	5	26	Pere Marquette R. R.	
Marshall.	Calhoun.	896	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Midland.	Midland.	604	13	8.2	-15.0	31	1	-20	13	35	—	—	—	—	—	2	1	27	w.	
Morenci.	Lenawee.	811	5	13.4	—	39	18	-18	13	29	1.21	—	0.70	6.7	8	6	3	22	Pere Marquette R. R.	
Mount Clemens.	Macomb.	615	12	13.5	-10.8	39	1	-18	13	33	2.82	+ 1.23	1.02	18.0	7	16	5	10	George J. Tripp.	
Mount Pleasant.	Isabella.	828	13	9.6	-11.6	30	22	-17	13	36	—	—	—	—	—	16	5	10	Waterworks.	
Muskegon.	Muskegon.	587	16	11.2	-12.1	37	1	-12	5	29	2.40	-0.25	0.50	28.0	13	19	0	12	Pere Marquette R. R.	
Old Mission.	Grand Traverse.	588	18	8.0	-14.2	24	1	-7	7	20	4.49	+ 2.41	1.25	27.6	19	4	8	19	Grand Rapids & Indiana Ry.	
Olivet.	Eaton.	934	22	10.2	-12.8	36	18	-13	13	23	1.63	-0.54	1.00	7.4	12	7	0	24	E. O. Ladd.	
Omer.	Arenac.	616	13	7.2	-13.4	31	31	-17	13	34	0.85	-0.62	0.60	8.5	3	4	1	26	G. A. Knapp.	
Onaway.	Presque Isle.	826	9	3.4	—	24	1	-21	12	26	0.70	—	0.40	7.0	3	13	4	14	Do.	
Owosso.	Shiawassee.	731	15	10.2	-11.4	36	18	-15	13	28	0.82	-1.11	0.30	8.2	10	5	13	w.	Owosso Sugar Co.	
Petroskey.	Emmett.	660	22	6.0	-13.2	24	1	-18	12	24	2.90	+ 0.60	0.40	29.5	15	2	8	21	Grand Rapids & Indiana Ry.	
Plymouth.	Wayne.	725	15	10.8	-13.6	39	18	-16	13	31	0.49	-1.32	0.20	5.0	4	8	12	11	Pere Marquette R. R.	
Pontiac.	Oakland.	935	12	11.2	-14.3	36	46	1	-13	13	29	1.27	-0.85	0.40	11.0	5	14	6	11	Fred W. Shaw.
Port Austin.	Huron.	618	15	10.7	-1															

TABLE 1.—Climatological data for January, 1912. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.		
Ohio—Continued.																				
Defiance.	Defiance.	712	18	14.2	-12.0	40	18	-26	13	37	1.21	-0.83	0.77	4.5	12	7	13	15	16	w.
Findlay.	Hancock.	776	23	14.4	-12.5	42	18	-21	13	33	1.51	-1.02	0.60	6.0	7	13	15	3	sw.	John F. Heilshorn.
Fremont.	Sandusky.	628	10	16.0	-13.0	39	18	-14	13	30	1.90	-0.68	1.01	9.8	8	14	5	12	sw.	Dr. E. A. Moser.
Hedges.	Paulding.	723	18	15.4	-11.1	40	18	-23	13	35	1.79	-0.87	1.40	4.0	5	11	3	17	w.	E. Stanley Thomas.
Hillhouse.	Lake.	997	19	14.2	-11.2	43	18	-24	13	41	3.35	+0.45	0.75	27.0	14	7	7	17	sw.	Chas. Stutzman.
Hiram.	Portage.	1,260	32	15.2	-9.8	43	18	-10	13	39	3.42	+0.63	1.01	14.5	16	8	4	19	w.	J. W. Doncaster.
Hudson.	Summit.	1,153	51																	Prof. G. H. Colton.
Lima.	Allen.	875	13	15.4	-11.9	39	18	-14	13	27	2.32	-0.92	0.75	17.5	11	6	14			Dr. W. I. Chamberlain.
Medina.	Medina.	944	24	15.6	-10.7	43	18	-24	13	40	2.47	-0.17	0.97	8.0	7	6	6	19	w.	Miss Ollie De Long.
Montpelier.	Williams.	880	20	13.6	-9.7	39	18	-19	13	31	2.30	+0.15	1.00	13.0	9	5	4	22	w.	F. W. Clark.
Napoleon.	Henry.	680	25	15.7	-10.7	40	18	-17	13	27	1.73	-0.38	1.00	6.5	8	7	3	21	nw.	G. L. Laser.
New Bremen.	Auglaize.	1,038	19	16.0	-11.7	39	18†	-18	13	31	1.45	-0.92	0.45	9.0	6	17	9	5	w.	A. C. Senter.
North Royalton.	Cuyahoga.	1,000	19	15.2	-10.8	43	18	-11	13	38	3.14	+0.28	1.00	11.0	9	4	18	w.	Miss Lillian Grothaus.	
Northwalk.	Huron.	719	26	16.3	-10.6	41	18	-23	13	39	2.50	-0.02	0.80	12.5	8	2	11	18	w.	W. S. Edgerton.
Oberlin.	Lorain.	855	37	16.8	-9.0	43	18	-13	13	36	2.78	+0.56	0.68	12.9	13	8	7	16	w.	Giles G. Gregory.
Ottawa.	Putnam.	720	19	15.6	-11.6	39	18	-21	13	33	1.33	-1.21	0.70	7.0	11	9	9	13	nw.	Prof. F. F. Jewett.
Sandusky.	Erie.	629	35	15.4	-10.9	41	18	-5	13	29	1.62	-0.48	0.68	10.4	16	5	10	16	w.	Prof. J. T. Maidlow.
Tiffin.	Seneca.	775	30	16.4	-10.9	40	18	-14	13	29	3.11	+0.48	1.12	15.5	12	9	9	13	w.	U. S. Weather Bureau.
Toledo.	Lucas.	765	41	15.2	-10.4	41	18	-5	7	26	1.78	-0.14	0.95	7.4	14	8	7	16	sw.	Prof. T. H. Sonnedecker.
Upper Sandusky.	Wyandot.	854	29	16.0	-10.8	44	29	-16	13	32	1.85	-0.75	0.42	12.8	10	9	9	13	w.	U. S. Weather Bureau.
Vickery.	Sandusky.	588	19	15.0	-11.9	40	18	-18	13	35	1.48	-0.79	0.70	6.7	12	4	8	19	w.	Robert E. Tracht.
Wauseon.	Fulton.	780	40	13.0	-10.6	39	18	-19	13	31	1.40	-0.98	0.59	12.4	18	6	11	14	w.	John W. Barr.
Willoughby.	Lake.	649	18								3.56	+1.11	0.82	15.0	13	5	2	24	w.	Thomas Mikesell.
																			C. M. Richardson.	
Pennsylvania.																				
Erie.	Erie.	658	39	16.4	-10.1	47	18	-9	13	31	3.46	+0.43	0.71	23.5	26	1	6	24	w.	U. S. Weather Bureau.
New York.																				
Adams Center.	Jefferson.	540	21	11.7	-9.9	46	19	-24	6†	44	6.17	+2.07	1.00	57.5	23	5	10	16	n.	A. E. Cooley.
Angelica.	Allegany.	1,340	29	14.0	-8.9	43	18†	-29	13	37	2.49	-0.19	0.73	14.5	14	0	5	26	w.	Chas. P. Arnold.
Appleton.	Niagara.	270	21	16.3	-10.0	44	19	-7	14	32	2.26	-0.42	0.53	15.2	17	0	4	27	sw.	H. A. Van Wagoner.
Auburn.	Cayuga.	715	43	15.4	-8.5	42	18	-12	13	34	1.92	-0.61	0.42	19.0	11	17	12	2	n.	A. H. Underwood.
Avon.	Livingston.	585	17	15.6	-8.6	44	18	-16	26	33	1.29	-0.55	0.54	10.5	8	2	12	17	w.	W. G. Markham.
Blue Mountain Lake.	Hamilton.	1,750	12								3.40	+0.16	0.80	32.0	11	7	10	14	w.	B. F. Merwin.
Brockport.	Monroe.	537	16	15.4	-8.4	44	18	-8	26	30	3.57	-0.34	0.61	25.0	17	2	10	19	w.	W. H. Lennon.
Buffalo.	Erie.	767	61	15.6	-9.1	44	18	-3	13	35	3.00	-0.30	0.60	22.9	25	2	14	15	w.	U. S. Weather Bureau.
Canton.	St. Lawrence.	448	18	14.8	-11.5	43	18	-30	26	38	2.59	-0.57	0.42	24.9	21	6	9	16	w.	Do.
Cape Vincent.	Jefferson.	246	7	10.5		41	18	-21	26	35	3.29		0.88		15	10	6	15	w.	J. Harry Grapette.
Carvers Falls.	Washington.	243	14	11.4	-6.7	45	19	-30	26	48	1.17	-0.67	0.51	14.0	4	20	2	9	w.	Washburne, Fancher, C. E.
Chazy.	Clinton.	151	12	7.2	-8.6	37	19	-32	26	37	0.75	-0.97	0.30	7.5	4	17	10	4	w.	W. R. North.
Dannemora.	Clinton.	1,490	7	7.6		40	19	-26	6	29	1.23		0.34	18.5	13	10	5	16	w.	Dr. W. N. Thayer.
Elba.	Geneesee.	500	13	13.2	-10.5	44	19	-16	26	42	3.90	+0.63	0.60	34.0	14	3	12	16	sw.	Joseph S. Willard.
Faust.	Franklin.	1,550	1																	Santa Clara Lumber Co.
Fayetteville.	Onondaga.	530	11	14.8	-9.0	46	18	-20	13	32	0.87	-1.34	0.24	8.0	11	17	3	11	nw.	Dana H. Wells.
Gabriels.	Franklin.	1,729	10	6.1		41	18	-32	26	40	1.51		0.35	11.2	11	5	14	12	nw.	Gabriels Sanitarium.
Harkness.	Clinton.	622	10	8.5	-9.7	40	19	-22	26	38	2.58	-0.67	0.17	12.5	8	21	5	15	w.	J. W. Harkness.
Hemlock Lake.	Livingston.	900	14	15.5	-8.8	47	19	-13	13	36	2.00	-0.65	1.20	6.0	5	1	2	10	w.	D. H. Westbury.
Hunt.	do.	1,321	13	14.2	-10.0	47	18	-20	13	36	2.00	-0.65	0.63	9.0	19	11	11	11	nw.	W. S. Barager.
Ithaca.	Tompkins.	928	14	16.6	-7.5	46	18	-16	13	43	1.63	-0.83	0.63	9.0	19	11	11	11	nw.	U. S. Weather Bureau.
Keene Valley.	Essex.	1,000	14	11.0	-7.4	42	19	-25	26	43	1.86	-1.41	0.55	18.2	12	15	6	10	nw.	E. R. Wells.
King Ferry.	Cayuga.										1.25	+1.10	0.35	14.1	13	4	9	18	w.	Lucius A. Goodyear.
Lake George.	Warren.	350	15	11.8	-6.7	38	1	-19	26	38	1.98	-2.10	0.63	16.6	11	5	11	15	w.	Charles Forsell.
Lake Placid Club.	Essex.	1,864	4	3.3		37	18†	-33	26	41	3.70		0.50	39.8	16	10	9	12	w.	Henry van Hoevenberg.
Lockport.	Niagara.	650	25	15.0	-10.1	43	19	-9	13†	32	2.70	+0.21	0.63	17.2	15	9	11	11	sw.	Robert N. Clark.
Lowville.	Lewis.	900	45	6.4	-12.3	42	18	-31	13	43	2.68	-0.11	1.25	7	10	4	17	w.	Charles J. Rice.	
Moira.	Franklin.	200	12	5.2	-10.1	43	18†	-7	14	34	3.18	+0.30	0.70	25.5	14	9	13	9	nw.	C. E. McBride.
Nehasane.	Hamilton.	1,750	4	5.0		40	19	-43	13	43	4.17		0.65	50.4	22	10	10	11	nw.	L. W. Brown.
North Lake.	Herkimer.	1,822	11																	John F. Redmond.
Ogdensburg.	St. Lawrence.	175	28	8.6	-8.5	42	19	-28	26	38	1.42	-0.73	0.50	14.2	5	12	7	7	se.	State Hospital.
Old Forge.	Herkimer.	1,733	4	7.4		40	19	-43	13	47	4.55		1.16	53.9	19	13	4	14	w.	Mrs. S. W. Nelson.
Oswego.	Oswego.	325	42	15.2	-8.7	45	18	-11	13	28	5.04	+1.88	0.97	47.4	26	2	1	28	se.	U. S. Weather Bureau.
Otto.	Cattaraugus.	1,410	8	15.0		44	18†	-11	6	36	1.15		0.28	7.7	9	9	10	12	sw.	William J. Wienk.
Palermo.	Oswego.	460	53								2.92	+0.34	0.35	29.8	18	15	7	21	w.	E. B. Bartlett.
Perry City.	Schuyler.	1,038	32	13.0	-9.6	44	18	-20	14	38	1.80	-0.99	0.54	4.7	12	2	8	21	nw.	W. H. Jeffers.
Philadelphia.	Jefferson.	485	6	9.4		44	19	-27	28	39	2.33		0.31	23.5	19	10	8	13	w.	E. D. Babcock.
Potsdam.	St. Lawrence.	300	36	7.7	-9.9	43	19	-25	13	36	2.03	+0.09	0.4							

TABLE 2.—*Daily precipitation for January, 1912. District No. 4, Lake Region.*

TABLE 2.—*Daily precipitation for January, 1912. District No. 4—Continued.*

Stations.	Watershed.	Day of month.																														Total.		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
<i>Lower Peninsula—Continued.</i>																																		
Bay City.	Saginaw.	.05	.10	.20	.50	.35	.10	.20	.20	.10	T.	.08	1.50	.60	—	T.	.10	.20	.80	.50	.10	.10	.02	.03	.20	.05	.05	.05	.05	.05	.05	1.30		
Benzonia.	Betsey.	T.	.05	.01	T.	T.	.31	.11	—	—	—	—	.02	.04	—	.01	.03	T.	.01	—	.14	T.	T.	.02	T.	.07	.01	.01	.01	.01	.01	0.79		
Berlin.	Clinton.	.07	.05	T.	.40	.40	.20	.30	.25	.20	.03	T.	—	.10	.40	—	.06	.04	—	—	.15	T.	T.	.02	T.	.07	.01	.01	.01	.01	.01	1.72		
Big Rapids.	Muskegon.	T.	.65	T.	.40	.40	.20	.30	.25	.20	.03	T.	—	.03	.10	T.	T.	.02	—	.04	.02	.01	T.	.05	.10	.15	T.	T.	T.	T.	T.	2.35		
Bloomingdale.	L. Michigan.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.69		
Cadillac.	Manistee.	.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.69	
Cassopolis.	St. Joseph.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.95	
Charlevoix.	L. Michigan.	.20	—	.30	—	—	—	.80	.20	—	.30	—	—	.20	—	.60	.20	—	.20	.20	.30	—	.10	—	—	—	—	—	—	—	—	—	3.00	
Charlotte.	Kalamazoo.	.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	
Cheboygan.	Cheboygan.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.70	
Clinton.	Raisin.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.71	
Coldwater.	St. Joseph.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.50	
Concord.	Kalamazoo.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.50	
Croton.	Muskegon.	.30	T.	T.	.10	T.	—	.40	.10	T.	T.	—	.20	.10	T.	T.	.10	T.	T.	.10	T.	T.	.10	T.	T.	1.50								
Detroit.	Detroit.	T.	T.	.03	T.	.02	.01	.58	.22	T.	T.	T.	.10	—	.23	.68	T.	.01	—	.08	T.	T.	T.	.17	T.	.02	.03	.01	.01	.01	.01	.01	.01	1.99
Durand.	Saginaw.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
East Tawas.	Lake Huron.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Eloise.	Rouge.	.05	T.	—	.01	.01	.01	—	.28	.10	T.	—	—	T.	.03	—	.10	.44	.10	T.	—	—	.11	—	.06	.03	T.	—	.01	T.	.134			
Flint.	Saginaw.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.46	
Frankfort.	Betsey.	.10	.20	.40	.20	.40	.30	.20	.20	.10	—	.20	.80	.30	—	.20	.30	.10	.10	.20	—	.20	—	—	—	—	—	—	—	—	—	5.20		
Ganges.	L. Michigan.	T.	.20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.10	
Gaylord.	Cheboygan.	.09	.01	T.	.05	—	—	.19	.22	.20	.08	.03	—	.10	.10	—	.15	T.	.05	T.	.02	T.	—	T.	.06	.04	—	—	—	—	—	—	—	1.39
Gladwin.	Saginaw.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	
Grand Haven.	Grand.	T.	.04	.11	.13	.12	.10	.11	.39	.16	.07	.04	T.	.03	.18	.02	T.	—	T.	.04	.27	.01	.15	T.	.01	.07	.01	T.	.01	T.	.01	T.	2.08	
Grand Rapids.	do.	.03	.01	.07	.09	.02	.03	.04	.21	.22	.02	.01	T.	—	.25	—	T.	.01	T.	.04	.02	T.	.07	T.	.05	.06	.02	T.	.01	T.	.01	T.	1.49	
Grape.	Raisin.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.16	
Grass Lake.	Grand.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.56	
Grayling.	Au Sable.	T.	T.	—	.04	T.	—	.24	.14	T.	—	—	.22	T.	—	.12	T.	T.	.02	.04	.03	T.	—	T.	0.95									
Harbor Beach.	Lake Huron.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.00	
Harrison.	Saginaw.	.20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.50	
Hart.	Lake Huron.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.30	
Hayes.	Pentwater.	.30	.20	.10	.10	.20	.10	.10	.50	.10	.20	—	—	.30	1.40	.80	—	.10	.30	T.	.40	—	.10	.10	—	.10	—	.10	—	.10	.05			
Hightland.	Pigeon.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.50	
Hillsdale.	Huron.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	
Hoyle.	St. Joseph.	.05	.01	.05	.03	.05	—	.35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.03	
Holland.	L. Michigan.	—	.05	.10	.09	.15	.05	.13	.81	.51	.10	.05	—	.20	T.	.01	—	.01	.05	.15	T.	.09	.06	.03	.12	—	T.	.15	—	—	2.99			
Howell.	Saginaw.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.33	
Ivan.	Grand.	T.	T.	T.	T.	.02	T.	—	.20	T.	—	—	.40	T.	—	.20	T.	T.	.01	.20	T.	0.95												
Jackson.	St. Clair.	T.	T.	T.	T.	.02	T.	—	.40	T.	—	—	.10	T.	—	.03	T.	T.	.02	.05	T.	0.05												
Jeddo.	Kalamazoo.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.12	
Kalamazoo.	Lansing (Agr. Col.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.80	
Lansing (Capitol).	do.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.73	
Lapeer.	Saginaw.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.00	
Ludington.	Pere Marquette.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.00	
Luther.	Manistee.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	76	
Mackinaw.	Clinton.	.40	.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.00	
Mancelona.	L. Michigan.	.20	.10	—																														

TABLE 2.—*Daily precipitation for January, 1912. District No. 4—Continued.*

* Precipitation included in that of the next measurement.

† Separate dates of falls not recorded.

Precipitation for the 24 hours ending on the morning when it is measured.

T. Precipitation is less than 0.01 inch rain or melted snow.

TABLE 3.—Maximum and minimum temperatures at selected stations for January, 1912. District No. 4, Lake region.

Date.	Duluth, Minn.		Wisconsin.				Chicago, Ill.		Fort Wayne, Ind.		Upper Michigan.						Lower Michigan.											
			Florence.		Green Bay.						Escanaba.		Ewen.		Houghton.		Marquette.		Sault Ste. Marie.		Alpena.		Battle Creek.					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				
1....	3	-17	18	-7	19	-10	11	1	17	6	28	14	16	-5	14	-7	14	2	18	-6	18	1	26	12	19	13	16	11
2....	-6	-26	1	-19	1	-12	5	-4	15	5	27	13	9	-11	3	-17	8	-1	10	-7	13	-7	17	8	20	14	16	6
3....	-6	-20	2	-24	-2	-13	8	-4	20	5	21	9	6	-11	1	-17	6	-5	7	-9	11	-5	15	1	18	6	11	1
4....	-12	-25	2	-20	-4	-18	2	-11	7	-6	18	-4	3	-14	-7	-22	2	-8	0	-12	10	-6	15	1	18	7	14	2
5....	-22	-32	-7	-19	-10	-22	-11	-18	-5	-10	0	-6	-4	-17	-9	-22	-4	-12	-3	-22	-3	-17	3	-8	7	-1	3	-11
6....	-14	-32	-10	-33	-12	-26	-8	-18	-1	-11	4	-5	-4	-21	-9	-31	-7	-15	-2	-22	-9	-26	7	-12	4	-7	0	-15
7....	-17	-36	-11	-31	-12	-27	-2	-18	2	-16	0	-14	-4	-22	-12	-31	-7	-16	-3	-17	-2	-14	6	-5	2	-6	-1	-9
8....	-1	-18	-2	-16	0	-12	8	-5	8	-3	20	-3	3	-14	2	-16	5	-16	5	-13	11	-3	19	-4	11	-5	-11	5
9....	-10	-31	-2	-15	-6	-17	-1	-10	7	-4	6	-4	2	-15	-6	-26	3	-7	-15	8	-6	13	2	7	-3	7	-1	
10....	-16	-36	-12	-25	-10	-22	-4	-13	5	-6	11	-2	-4	-19	-26	-5	-10	-3	-18	-1	-10	7	-8	7	7	0	-8	
11....	-19	-35	-12	-25	-6	-20	-4	-14	9	-3	10	3	-5	-19	-13	-23	-6	-13	-1	-23	7	-8	8	-3	1	-11	1	
12....	-14	-34	-8	-30	-4	-25	-1	-14	12	-3	8	-5	-2	-18	2	-29	-3	-28	0	-16	-8	-30	7	-13	5	8	4	-24
13....	2	-18	4	-28	9	-20	13	-9	14	-1	11	-9	-16	6	-21	9	-28	8	-13	10	-25	9	-10	10	-15	6	-16	
14....	1	-17	5	-11	13	-4	17	0	21	4	19	6	9	-3	6	-13	7	-7	10	2	12	16	8	15	7	15	3	
15....	0	-22	2	-11	7	-6	7	-5	9	-2	15	3	7	-2	3	-8	4	-4	10	5	-5	-13	10	-3	15	1	15	-4
16....	8	-9	7	-16	16	-12	16	-5	16	-2	14	2	12	-5	10	-25	11	-13	13	6	4	-16	10	0	16	-1	12	-8
17....	15	-1	15	5	20	12	25	12	33	15	38	13	18	5	15	7	12	18	4	20	9	29	12	18	10	10	19	
18....	-1	-16	13	-5	16	-3	23	6	31	13	42	20	16	-8	15	-8	14	-5	16	-7	21	-2	26	8	36	24	22	7
19....	-1	-20	-1	-18	-2	-14	6	-8	13	0	20	5	3	-13	0	-20	0	-8	5	-11	6	-4	10	-2	25	6	17	-3
20....	5	-14	7	-11	7	-8	13	2	23	2	24	3	10	-8	7	-29	4	-11	9	-10	7	-17	12	0	19	-1	11	-1
21....	14	-7	10	-5	12	-6	17	-1	31	2	33	7	14	-6	11	-14	9	-4	15	-4	14	-20	21	4	22	4	19	12
22....	15	1	18	-15	16	-1	25	15	37	22	39	31	15	-2	4	-24	16	-9	18	-2	13	5	18	0	32	14	17	-7
23....	14	1	16	4	23	3	28	11	38	20	38	24	21	3	14	-20	15	0	19	4	18	4	32	24	19	14		
24....	3	-8	9	0	9	1	17	6	25	10	24	16	6	-6	5	0	-9	5	-7	4	-15	11	1	24	11	19	-2	
25....	2	-6	5	-8	5	-4	16	6	26	13	25	14	5	-10	8	-17	2	-15	6	-10	2	25	8	16	10	10	-2	
26....	6	-6	10	-18	12	-1	26	13	29	24	25	18	16	-10	8	-26	4	-13	7	-8	8	-10	14	8	18	14	11	5
27....	9	-10	9	-17	9	-7	20	-1	26	19	21	15	9	-9	16	-11	4	-15	5	-6	8	-6	12	1	15	5	11	4
28....	10	0	9	-18	19	-9	26	20	27	17	25	14	17	-15	19	5	15	-17	16	-4	14	5	23	-3	18	-4	11	-16
29....	21	4	23	9	22	12	24	15	26	18	26	19	19	22	15	20	14	20	14	24	21	22	18	20	11	26	17	
30....	21	4	20	12	24	12	26	15	27	15	24	17	23	12	25	26	17	22	8	23	12	26	17	20	14	26	14	
31....	20	8	24	-12	21	0	28	10	31	15	29	14	19	1	30	-25	23	-9	26	3	21	6	24	4	25	10	22	-3
Mns..	1.0	-15.4	5.2	-14.2	6.8	-9.0	12.1	-1.0	18.7	5.1	20.9	7.4	8.6	-8.5	5.0	-17.9	6.4	-8.6	9.1	-6.4	8.7	-8.4	14.9	0.1	17.5	5.3	12.0	-1.7

Date.	Lower Michigan.				Ohio.				Erie, Pa.				New York.				Vermont.										
	Detroit.	Muskegon.	Saginaw, West Side.	Cleveland.	Lima.	Sandusky.	Toledo.	Buffalo.					Canton.	Rochester.	Syracuse.	Burling- ton.	North- field.										
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.							
1....	25	17	37	32	27	18	28	23	29	19	29	22	29	19	28	21	29	26	34	10	32	26	35	13	35	6	
2....	24	13	20	12	20	8	29	24	30	21	29	21	29	16	31	21	27	15	29	24	32	23	30	12	32	0	
3....	21	8	21	9	17	0	25	19	25	11	21	15	19	9	27	18	25	16	20	2	26	19	27	7	26	-2	
4....	17	2	20	-5	16	4	23	3	18	4	20	2	20	1	27	11	29	9	14	14	28	13	21	4	21	6	
5....	5	-4	7	-12	9	-6	7	-2	5	5	-4	9	-4	-4	12	0	9	19	-15	14	3	19	2	16	-2		
6....	5	-2	6	-4	5	-8	5	-1	6	-4	6	-2	6	-2	10	3	9	-1	-13	6	1	2	-12	-3	-15	-2	
7....	3	-2	10	-5	4	-9	5	-2	4	-12	5	-4	6	-5	7	0	9	0	-5	4	-24	10	1	12	-1		
8....	21	0	10	3	15	6	32	-1	12	-4	30	1	23	0	30	-1	35	0	32	-6	37	0	41	2	23	-15	
9....	7	-4	6	0	11	-2	10	-2	13	-2	6	-1	7	-1	7	0	26	5	36	6	36	5	41	8	32	11	
10....	7	0	5	-1	5	-7	11	3	12	-1	12	1	14	1	9	2	6	3	6	5	9	4	10	3	11	2	
11....	10	2	4	-2	10	-4	10	7	11	-2	10	7	9	4	13	7	13	3	5	-19	11	4	14	3	8	-14	
12....	12	0	8	-21	10	-8	9	-1	10	0	8	1	11	1	11	9	-1	8	1	22	9	30	10	29	12	19	-18
13....	9	-1	10	-2	11	-15	10	-8	10	-14	11	-5	9	-3	8	-9	-3	7	-26	7	-5	13	-2	13	-24	1	
14....	18	9	21	4	18	-9	23	1	20	4	22	4	20	5	25	4	26	2	11	15	24	-2	22	17	17	-24	
15....	16	-4	16	2	17	-7	18	-3	20	-2	14	0	11	2	1												